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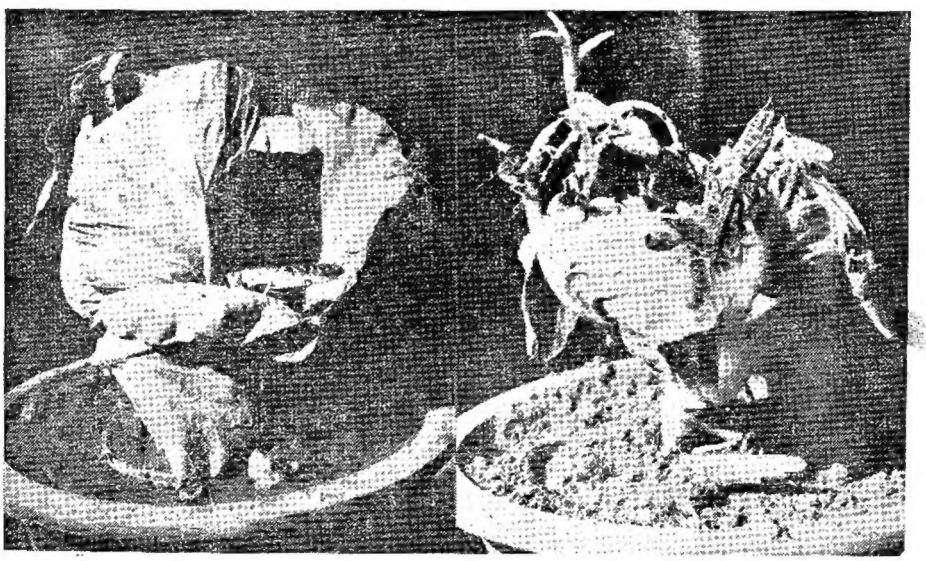

Antifeeding property of 'neem' kernel suspension, treated (L) and untreated (R) cabbage plants.

(Please see the article on page 75)

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FELICITATION

It is our proud privilege to announce the election of Dr. N. C. Pant, Professor of Entomology, I.A.R.I. as Fellow of the Indian National Science Academy. The editors on their behalf and on behalf of the staff and students of the Division of Entomology, extend their heartiest congratulations to Professor Pant.

Editors

Repeated Confirmation of our discovery of Antifeedant Property of 'Neem' Kernel

(This resume has become necessary in view of the serious criticisms the discovery had to face when it was first reported.—Editors)

In an article published recently (Nature, 232 ; 402-403, Aug. 6, 1971), Gill and Lewis have reported that three products of 'neem' seed (*Azadirachta indica*) *viz.* (i) *azadirachtin*, a pure chemical extracted from neem seed, (ii) an alcoholic concentrate, refined from a 5 per cent ethanol extract of 'neem' seed and (iii) an aqueous suspension prepared by grinding seed kernels in water and passed through 100 mesh sieve, have exhibited deterrency against the desert locust *Schistocerca gregaria* Forskal and a property of systemic uptake in bean plants. They have also reported that the plant nematodes of the genus *Pratylenchus* are also deterred by the aqueous suspension of the 'neem' kernels.

These findings further support our earlier discovery about the antifeeding property of 'neem' seed kernel against the desert locust, *Schistocera gregaria* which was first reported by the authors in 1962. The systematic work on 'neem' products was initiated in the Division of Entomology, I.A.R.I., during the early sixties when we received a few samples of the isolates of 'neem' seed oil from Dr. Mitra of the National Chemical Laboratory, Poona.

Two of the isolates labelled as total bitters of 'neem' (crude) and 'Nimbidin T' (pharmaceutical quality) were tested against the adults of *S. gregaria*, *Locusta migratoria* Linnaeus, *Poecilocerus pictus* Fabricius and *Aulacophora foveicollis* Lucas and the final instar larvae of *Euproctis lunata* Walker and *Prodenia litura* (Fabricius). The trials indicated varying degree of gustatory repellency of the two products against these insect pests. The antifeeding property as indicated by the amount of treated food eaten, was more pronounced against the two species of locusts and the crude product was found to be superior to the refined product. The subsequent trials were carried out with the 'neem' seed kernel suspensions against the two species of locust. The degree of repellency was found to be greater against the desert locust, where no feeding was observed on cabbage leaves

treated with 0 001 per cent suspension and only 44.4 per cen at 0.0005 per cent suspension as against 100 per cent feeding on untreated leaves. The findings were thought to be of great practical value for protecting crops against locusts, particularly in areas which are invaded by the locust swarms during the outbreaks. A popular article giving the significant results and the simple method for treating the crops during the outbreaks was published by the authors in the Indian Farming (vol. 12 part 8, 1962).

The published results as well as personal discussions the Senior author had with a number of leading Entomologists, during his world tour in 1965, created a considerable interest in the findings. On request, this laboratory sent a number of packets of 'neem' seeds to Israel, England and America. Apparently the interest created was sustained in at least two independent groups of workers who soon came out with results which not only corroborated our findings but also went ahead by isolating and identifying the active ingredients responsible for antifeeding property of the 'neem' seed

In 1967 Lavie *et al (Chem. Comm.*, 1967-910) from Tel Aviv, Israel, reported that an isolate of 'neem' seed with m.p. 176-178°C and empirical formula of $C_{30}H_{50}O_5$, showed 100 per cent antifeeding activity against locust hoppers at a very low dosage. This fraction was named as *meliantriol* (1) and was also synthesised by these workers. In the next year Butterworth and Morgan of Keele University, reported the isolation of yet another substance from *Azadirachta indica*, which was found to be a very potent inhibitor of feeding in the desert locust. They called this substance as '*azadirachtin*' and stated that it is not related to *meliantriol*, it is a micro-crystalline powder with m.p. of 155-158°C (*Chem. Comm.*, 1968, 23).

The work in this laboratory was continued to test the antifeeding and deterrent properties of neem seed against other important pests. Mane (Unpublished) found absolute antifeeding property of 'neem' kernel suspension at 0.01 per cent against the castor hairy caterpillar *Euproctis lunata*. Higher concentrations of the suspension were found to significantly reduce feeding of *Prodenia litura* larvae and *Acrida exaltata* Walkr adults. Jotwani and Sircar (1965 and 1967) showed that neem seed powder can effectively protect the stored wheat seed against *Rhizopertha dominica* Fabricius, *Sitophilus oryzae* Linnaeus and *Trogoderma granarium* Everts and seeds of 'moong', gram, cowpeas and peas against the pulse beetle, *Callosobruchus maculatus* Fabricius.

The insect deterrent property of 'neem' seed is now well established. Two of the active ingredients have been isolated and identified. It is also indicated that the antifeeding and deterrent properties are shown against not only the desert locust but against some other pests also. The finding of Gill and Lewis regarding the systemic property of 'neem' seed products is very important. All these findings lead to the conclusion that intensive work is needed to economically exploit the 'neem' seed, one of the nature's bounty, found in a number of countries, in the pest control programmes.

It is gratifying to note that an active interest in popularising the utilization of 'neem' in pest control and as manure is being taken by Shri C.M. Ketkar, Technical adviser to the 'neem' Cake Manurial Project of the Khadi and Village Industries Commission. This Organisation in collaboration with the All India Non-edible Oil Industry Association and the Indian Agricultural Research Institute, is planning to organise a symposium on "the role of 'neem' in the Indian economy", shortly.

S. Pradhan & M. G. Jotwani

Donation to the National Pusa Collection

The following are some of the additional species of Thysanoptera received as donation to the NPC from Dr. T. N. Ananthakrishnan of Loyola College, Madras.

Dendrothrips cibarius Ananthakrishnan
Dendrothrips sexmaculatus Bagnall
Dendrothripoides ipomeae Bagnall
Diaphorothrips unguipes Karny
Diceratothrips usitatus Ananthakrishnan & Jagadish
Dinothrips sumatrensis Bagnall
Dolicholepta gracilipes Ramakrishna & Margabandhu
Dolichothrips indicus (Hood)
Ecacanthothrips sanguineus Bagnall
Elaphrothrips beesoni Ramakrishna
Elaphrothrips procer Schmutz
Elaphrothrips productus Priesner
Euphysothrips fungivora (Ramakrishna & Margabandhu)
Euryaplothrips crassus Ramakrishna & Margabandhu
Exothrips henavarna (Ramakrishna & Margabandhu)
Frankliniella sulphurea Schmutz
Franklinothrips megalops (Trybom)

Donation to the National Pusa Collection (Contd.)

Gynaikothrips flaviantennatus Moulton
Gynaikothrips karnyi Bagnall
Gynaikothrips uzeli (Zimmerman)
Haplothrips ganglbaueri (Schmutz)
Helionothrips kadaliphilus (Ramakrishna & Margabandhu)
Heliothrips haemorrhoidalis (Bouche)
Hoplandrothrips indicus Ramakrishna & Margabandhu)
Hoplothrips fungosus Moulton

Usha Ramakrishnan

Recovery of Exotic *Trichogramma spp.*

With a view to testing the potentiality of exotic natural enemies as biological control agents, four species of *Trichogramma viz.*, *T. fasciatum* (*Perkins*), *T. perkinsi* Girault, *T. japonicum* Ashmead and *T. brasiliensis* Ashmead, obtained through Commonwealth Institute of Biological Control were periodically released in different pockets of the country. *T. fasciatum, T. perkinsi* and *T. japonicum* were released at Yamunanagar (Haryana) and Motihari (Bihar) where the sugarcane borers are potential hosts and at Nagpur (Maharashtra) where the main potential host in view is *Chilo zonellus* (Swinhoe). At Delhi *T. fasciatum* was released keeping in view the *Chilo zonellus* as main potential host and *T. brasiliensis* was released keeping in view the cotton bollworms as potential hosts. Also *T. brasiliensis* was released at Sirsa (Haryana) and Amaravati (Maharashtra) where it could be expected to attack cotton bollworms. Recoveries of *T. fasciatum* and *T. japonicum* were made from the eggs of *Scirpophaga nivella* Fabricius at Yamunanagar whereas *T. fasciatum* and *T. brasiliensis* were recovered on the eggs of *Corcyra cephalonica* Stainton, a laboratory host, specially exposed in the field at Delhi.

Atma Ram, R. N. Singh, A. K. S. Choudhury & R. S. Bali

The Delhi farmers' worry about the rice weevil

Because of the unusual wet weather conditions prevailing in the union territory of Delhi during the pre and post-harvest periods of the rabi crops this year, greater loss to stored wheat was apprehended. In persuance of this apprehension, a detailed survey on the pest position in stored wheat was undertaken in all the five blocks of the Union Territory of Delhi during October and November '71. The survey revealed that contrary to previous findings in which *Trogoderma* had been found to be the main pest, the rice weevil, *Sitophilus oryzae*

Linnaeus dominated this year in all the wheat stored in the villages. A maximum infestation of 46.60 per cent by this pest was observed during the course of the present survey. Also there was a substantial fall in the germinability of the wheat seeds, which could largely be attributed to the attack of the rice weevil.

P.B. Mookherjee, T.D. Yadav, S. Singh. S.C. Khanna & B. N. Bose

Increasing incidence of the paddy gall midge in Maharashtra

The paddy gall midge *Pachydiplosis oryzae* (Wood Mason) Mani has been assuming serious proportions in the different pockets. In this connection, the following significant observations have been recorded by us this year (1971).

The general belief has been that the paddy gall midge has a number of alternate hosts in different graminaceous weeds growing in uncultivated areas and along field bunds. Hence the recommendation has been to destroy these alternate hosts in order to reduce the pest infestation in the paddy fields. The Government, therefore, has been spending quite appreciable amounts for the destruction of these grasses which are supposed to be acting as alternate hosts.

Recent studies at Bondgaon (Maharashtra), however, have shown that the gall midge attacking grasses in the vicinity of paddy fields are different from *Pachydiplosis oryzae* infesting paddy. This has been confirmed by transmission experiments which show that the gall midge infesting alternate hosts did not transfer itself to paddy seedlings while gall midges of wild paddy ('Karga', 'Dewdhan', 'Lal', 'Sal' and 'Parsud' in local language) did readily transfer themselves to paddy seedlings under the same set of circumstances. Further it has also been reported that the parasites parasitising the gall midges infesting both paddy and grasses are common.

Thus, the implications of these observations are that the destruction of grasses which are supposed to be alternate hosts does not only constitute useless expenditure but it may prove harmful due to the destruction of common parasites.

B. L. Bhamburkar,* V. B. Davande,* M. T. Badwaik* &
N. D. Netinkar*

*Agricultural Research Station, Badnapur Distt. Aurangabad (Maharashtra)

Additional Hosts of DD-136 Nematode

DD-136 is an important insect parasitic nematode. It kills the insects by piercing the intestine of the host and releasing the bacterium *Achromobacter nematiphilus*. It has wide range of hosts, spread out in different orders mostly in the Lepidoptera.

In the Division of Entomology, I.A.R.I., larvae of the following ten additional species of lepidopterous pests have been found to be susceptible to DD-136 nematode in the laboratory.

Common Name	Scientific Name
Castor semilooper	*Achaea janata* (Linnaeus)
Sunn-hemp hairy caterpillar	*Utetheisa pulchella* (Linnaeus)
Spotted boll worm	*Earias fabia* (Stoll)
Castor Hairy caterpillar	*Euproctis lunata* Walker
Castor capsule borer	*Dichocrosis punctiferalis* (Guenee)
Tobacco caterpillar	*Prodenia litura* (Fabricius)
Sunn-hemp stemborer	*Laspeyresia pseudonectis* Meyrick
Juar stem borer	*Chilo zonellus* (Swinhoe)
Ragi Pink borer	*Sesamia inference* (Walker)
Bihar hairy caterpillar	*Diacrisia obliqua* (Walker)

S.B. Mathur, R.P. Srivastava & K.L. Srivastava

'Aging' in Esterases inhibited by Organophosphates

'Aging' is a process by which organophosphate inhibited cholinesterase changes to a form that is not readily reactivated either spontaneously or with inducing compounds such as PAM (Pyridine 2-aldoxime methiodide).

Investigations on comparative studies on 'aging' in House sparrow *Passer domesticus* L. and rat brain cholinesterase revealed that both enzymes differ significantly; in this property, bird brain enzyme 'aged' at a faster rate than that of rat brain enzyme. The half life ($t_{0.6}$) for 'aging' is nearly half for the enzyme from bird brain than rat brain enzyme. It has been seen that 'aging' *i.e.*, change from reactivable to unreactivable form followed first order kinetics.

The rate of 'aging' was found to be independent of the organophosphate leaving group and dependent on the nature of alkaloxy group and the enzyme. Among the four inhibitors (methyl paraoxon,

sumioxon, oxygen analogue of dicapthon and paraoxon) paraoxon inhibited enzyme 'aged' at a fastest rate. It is due to the fact that paraoxon has a different alkaloxy group that is ethylated and other three have methylated group.

K.N. Mehrotra & Yogendra Singh

Disinfestation of Honey bee Combs

The honey bee combs are often subjected to severe infestation by *Achroia grisella* (Fabricius) in the hives as well as in stores. It was found that if the broodless combs are subjected to 55°C for an hour, all stages of this pest are killed without adversely affecting the combs. Seven comb frames can be disinfested at a time in Jeolekote villager's hive (17″×12″) with a 100 watt bulb, which gives a temperature of 55°C within an hour, killing all the stages of the pest including eggs.

This method of heat treatment can be employed even by a bee-keeper who does not possess facilities or skill of using poisonous fumigants.

M. Naim & D.S. Bisht

Theses Approved

Theses of the following candidates on the topics mentioned against each were approved.

Name of Candidate	*Title of thesis*	*Degree*
Sh. Sukumar Ray	Certain physiological and toxicological studies on the potato cutworm, *Agrotis ypsilon* Rottenberg.	Ph. D.
,, C.P. Malhotra	Chemical control of *Eublemma amabilis* Moore (Noctuidae : Lepidoptera)—a predator of lac insect, *Kerria lacca* (Kerr.) Syn. *Laccifer lacca* Kerr. (Tacharniidae : Homoptera).	,,
,, K. Ramasubbaiah	Residues and residual toxicity of phosphamidon in cowpea, bhindi, cabbage and mustard crops.	,,

Name of Candidate	*Title of thesis*	*Degree*
,, A.D. Pawar	Taxonomy of Indian Pentatomidae with special reference to genetalic armature.	Ph. D.
,, S. Anekawieng	Studies on relative susceptibility of different varieties of sorghum against *Sitophilus oryzae* (L.)	M. Sc.
,, G. D. Pimprikar	Varietal screening of rice to isolate strains resistant to 'gundhi bug' (*Leptocorisa varicornis* Fabricius and *Leptocorisa acuta* Thunberg) under field and field cage conditions.	,,
,, Amit Nath	Relative efficacy of various formulations of carbofuran for the control of shoot fly *Atherigona varia soccata* Rond.) on sorghum.	,,
,, N. Kaveeshwar	Estimation of microquantities of insecticides by bioassay and testing their formulations for quality control.	,,
,, B. R. Patil	Influence of diet on the haemolymph ionic content of *Schistocerca gregaria* Forskal.	
,, Vijay Singh	Study of comparative morphology of common Tingidae (Hemiptera) of Delhi.	,,
,, S. O. Dina	The reaction of various types of pulses on the life process of bruchids, *Callosobruchus chinensis* Linnaeus and *Callosobruchus maculatus* Fabricius.	,,

Journal of Entomology

It is noticed that from the current year the Royal Entomological Society of London has changed the title of their Proceedings,

Series A and B to 'Journal of Entomology, Series A General Entomology and Series B Taxonomy. Both the Series. further, are published twice a year instead four of the Series A and six of the series B of the Proceedings.

International Journal of Insect Morphology & Entomology

This new journal is being published under the chief-editorship of Professor A.P. Gupta of Rutgars University, New Brunswick, as a quarterly by Pergamon Press Ltd., Headington Hill Hall, Oxford OX3 OBW, England, from September, 1971. The editorial policy is to publish original papers on all aspects of the gross morphology, paleomorphology, macro and microanatomy and ultrastructures of insects, and similar studies of other related arthropods which have direct bearing on our understanding of insect morphology. In addition to descriptive enbryologic and post embryologic papers, reviews developing new concepts, hypotheses and theories will also be accepted.

The annual subscription is £ 12.00/$ 80.

Editors

International Organisation for Biological Control

The Commission of International Union of Biological Sciences (IUBS) operating mainly in Western Europe, the Mediterranean and Near-East has been strengthened to serve a more important and world wide role in view of the growing concern about problems created by pesticides and has now been renamed as the International Organisation for Biological Control of Noxious Animals and Plants (IOBC).

The 5th General Assembly of IOBC at Rome (30th March—3rd April, 1971) adopted proposals of the meeting held under the auspices of IUBS in November, 1969. These proposals involved a radical reorganization on the basis of a Central Council with world wide affiliations at Zurich, Switzerland, and large autonomous regional sections in different parts of the world. The General Assembly elected a new Executive Committee, including Professor P. De Bach as President and Prof. V. Delucchi as Secretary-General.

The membership of IOBC is open to (i) individuals (ii) research institutes, (iii) and other organisations engaged in related research or interested in promoting organisation's aims. The scope of the organizations activities is not restricted by the kind of pest organism, whether plant or animal.

Enquiries concerning membership can be directed to the Secretary-General of Central Organization.

V.M. Pawar

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